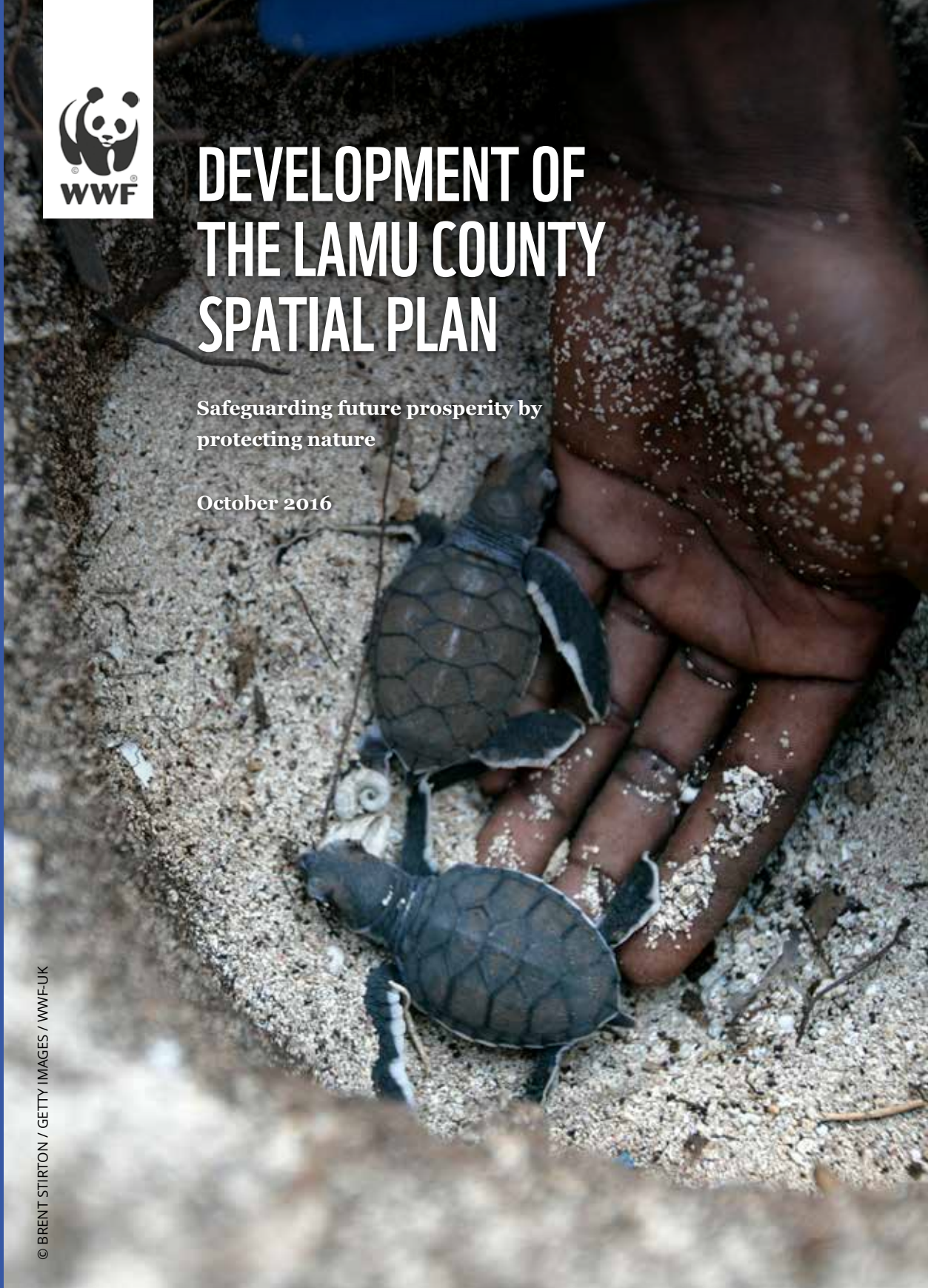
DEVELOPMENT OF THE LAMU COUNTY SPATIAL PLAN

Safeguarding future prosperity by protecting nature

October 2016



KEY POINTS

- Lamu is stepping into a new era of large-scale development and infrastructure investment, particularly through the multi-million dollar Lamu Port, South Sudan and Ethiopia Transport (LAPSSET) project.

- Whilst these developments could generate substantial economic and social benefits, they also pose significant risks. In particular, if poorly executed, they could lead to significant and irreversible environmental damage, including the loss of valuable natural capital assets (including forests, mangroves, water sources, beaches, seagrass, coral reefs and fisheries).

- These assets provide a range of vital goods and services that underpin the county's economy and well-being of its people (e.g. by providing water, fuel, food and raw materials; supporting farming, fishing, grazing, tourism and recreation; absorbing waste and carbon, and protecting people from hazards such as drought, flooding and storms).

- Many of these assets are already in decline due to human impacts, and the costs of this are already being felt. Further losses would undermine the ability of natural systems to sustain economic productivity and basic human needs, posing profound implications for Lamu's future prosperity.

- At the same time, Lamu County Government is developing a county spatial plan (CSP) to guide the development, use and conservation of land and resources in the county for the next 10 years.

- Lamu faces a choice: it can ignore nature in the SP and pay a heavy price, even in the short-term. Or it can use the SP to ensure that Lamu develops in such a way that it also safeguards its natural assets and, in doing so, helps to secure a prosperous and resilient future.

- A range of measures could be incorporated into the CSP to achieve this, including planning and designing development to avoid and/or mitigate impacts to natural capital; restoring critical assets; and identification of long-term natural capital investment requirements via the CSP's Capital Investment Framework (CIF).

WHAT IS THE PURPOSE OF THIS BRIEFING?

The purpose of this briefing is to help inform the development of the Lamu CSP, particularly related to how it considers natural capital issues. It highlights:

- Why it is important to take natural capital into account within the CSP, in order to secure the long-term economic prosperity and human well-being in Lamu;
- What the most important natural assets are in Lamu, in terms of the benefits they provide to the county's economy, businesses and people;
- What the status is of these assets, particularly which are declining and why, and where this is putting the benefits they provide at risk;
- What practical measures could be taken forward in the CSP, to protect and enhance critical natural assets in the most cost-effective way.

WHY IS IT IMPORTANT TO CONSIDER NATURAL CAPITAL IN THE LAMU COUNTY SPATIAL PLAN?

Lamu is stepping into a new era of large-scale development and infrastructure investment, particularly through the multi-million dollar Lamu Port, South Sudan and Ethiopia Transport (LAPSSET) project. Whilst these developments could generate substantial economic and social benefits, they also pose significant risks. In particular, if poorly executed, they could lead to significant and, in some cases, irreversible damage to the county's most important natural assets, including forests, grasslands, mangroves, water sources, beaches, seagrass beds, coral reefs and fishing areas (see Figure 1).

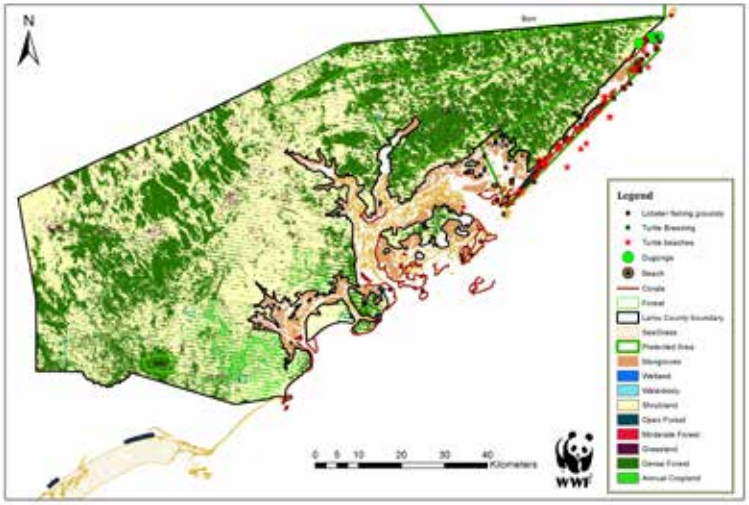


Figure 1 Map showing the location of some of Lamu's rich and diverse natural assets

These assets provide a range of vital goods and services that underpin the county's economy and the well-being of its people (e.g. by providing water, fuel, food and raw materials; supporting farming, fishing, grazing, tourism and recreation; absorbing waste and carbon, and protecting people from hazards such as drought, flooding and storms). Lamu's natural environment also holds important cultural and spiritual values for many communities.

However, many of these assets are already in decline due to human impacts, and the costs of this are already being felt. Further losses would undermine the ability of natural systems to sustain economic productivity and basic human needs, posing profound implications for Lamu's future prosperity.

At the same time, the Lamu County Government is developing a county spatial plan (CSP) to guide the development, use and conservation of land and resources in the county for the next 10 years. Lamu faces a choice: it could ignore nature in the CSP and pay a heavy price down the line, even in the sort term.

Or, Lamu could use the CSP to chart a development pathway that builds in measures to safeguard and restore its natural assets and, in doing so, help to secure a prosperous and resilient future. The gains from doing so could be significant, including buffering against economic risks, avoided public sector costs, increased inward investment, secure livelihoods, and improved public health.

WHAT IS THE CURRENT STATUS OF LAMU'S NATURAL ASSETS?

Many of Lamu's natural assets are on a steep downward trend due to human pressures. Mangroves and terrestrial forests are declining particularly rapidly, in terms of both quantity (e.g. habitat area and species populations) and condition. Kenya has already lost almost 40% of its mangroves in the last 30 years, mostly from Lamu County (which hosts some 70% of Kenya's total mangrove stock). Water sources (e.g. rivers and aquifers) and marine fish stocks are also being rapidly depleted and/or degraded.

Among the greatest threats affecting Lamu's natural assets are the clearance of habitats, including as a result of the LAPSSET corridor project (some components of which are already under construction, such as the port berths). Other threats include conversion of forests into farmlands (which is increasing the area of agricultural land) and increased extraction of natural resources (e.g. water, timber and fish) by the growing population.

WHICH BENEFITS PROVIDED BY LAMU'S NATURAL ASSETS ARE MOST AT RISK?

With the exception of increased crop yields and livestock grazing (associated with the expansion of agricultural activity), many of the benefits provided by Lamu's natural

assets are being put at risk as stocks are reduced (see Figure 2 below). Benefits at very high risk are the supplies of timber, wood fuel, water and commercial marine fish species. The benefits provided by forests and mangroves are at particularly high risk. This is a concern, because these benefits are critical to sustaining healthy diets, livelihoods and incomes.

Figure 2: Natural assets, ecosystem services (benefits) and current trends in benefit provision in Lamu

NATURAL ASSET	MAIN ECOSYSTEM SERVICES (BENEFITS) PROVIDED BY NATURAL ASSETS	TREND IN SERVICE (BENEFIT) PROVISION
Arable land	Food provision (food/cash crops)	▲
Grasslands	Livestock grazing	▲
Forests	Carbon sequestration Timber and wood fuel provision Water supply and flood protection (via regulation of water flows)	▼
Water resources (rivers, aquifers, lakes, wetlands)	Water supply and flood protection (via regulation of water flows)	▼
Terrestial species	Nature-based recreation	▼
Mangroves	Carbon sequestration Timber, wood fuel and food provision (fish)	▼
Coral reefs	Food provision (fish) Nature-based recreation	▼
Marine fishery	Food provision (fish)	▼
Marine species	Nature-based recreation	▼

In turn, loss of these assets is likely to also be indirectly affecting other benefits. Forest clearance is likely to be adversely affecting water supplies (due to their role in regulating water flows) and the potential for nature-based tourism (due to loss of wildlife habitat).

Loss of mangroves is also likely to be a major factor in the decline in marine fish catches over recent years (they are vital breeding and nursery areas for many commercial fish species).

WHAT ARE THE POTENTIAL FUTURE IMPLICATIONS OF DEVELOPMENT IN LAMU?

Proposed large-scale developments in Lamu, including the LAPSSET project and a planned coal plant, would have significant long-term deleterious effects on Lamu's natural assets. The potential impacts of LAPSSET include:

1) Direct loss of natural assets in areas cleared for the construction of project components, including the proposed new port, roads, railway, airport, resort town, oil refinery, fishing port, and new urban and industrial areas (this is shown as the 'primary impact area' in Figure 3).

2) Direct loss of natural assets over a larger area due to the wider development that LAPSSET would attract and/or require, such as new settlements, industries and infrastructure (this is shown as the 'secondary impact area' in Figure 3).

3) Indirect impacts due to increased pollution and extraction of water, food, fuel and raw materials by a much larger population (this is not shown in Figure 3, however, given the scale of the LAPSSET project, these impacts would be felt over large distances, including neighbouring counties and in offshore marine areas).

Geographical Information System (GIS) analysis suggests that over 150,000 ha of intact habitats (mainly mangroves, forests, coral reefs and seagrass beds) could be lost within these primary and secondary impact areas (see Figure 4). The possible further loss of over 9,400 ha mangroves would represent a 38 % in Lamu's total stock. Water resources, fishing areas and wildlife would also be significantly affected.

Figure 3 Map showing potential area in which direct loss of habitats would be expected due to construction of LAPSSET project components (primary direct impact area) and due to associated future development (secondary impact area).

Figure 4: Potential impacts of LAPSSET on key natural assets

NATURAL ASSET	CURRENT EXTENT IN LAMU (HA)	POTENTIAL IMPACTS OF LAPSSET PROJECT		TOTAL POTENTIAL LOSS (HA)	TOTAL POTENTIAL LOSS (AS % OF LAMU'S TOTAL STOCK)
		PRIMARY DIRECT IMPACTS (HA LOST)	SECONDARY DIRECT IMPACTS (HA LOST)		
Forests	265,552	7,076	23,558	30,634	12%
Grasslands	6,400	292	1,342	1,634	26%
Shrub lands	323,588	26,496	76,555	103,051	32%
Wetlands	227	11	82	93	41%
Mangroves	25,209	202	9,261	9,464	38%
Seagrass beds	30,049	1,198	6,509	7,707	26%
Total	**651,025**	**35,275**	**117,307**	**152,583**	**23%**

Data Sources:
- Land Use land cover of 2014 – Systems for Land based Emission Estimation in Kenya(SLEEK) Program
- Mangroves Cover – Regional Centre for Mapping of Resources for Development – SERVIR program on East African coastal mapping
- Seagrass beds – Regional Centre for Mapping of Resources for Development – SERVIR program on East African coastal mapping
- LAPSSET Growth Area – SIGHT Africa, WRI

WHAT ARE THE POTENTIAL ECONOMIC AND SOCIAL IMPLICATIONS OF THESE IMPACTS?

The implications of natural capital losses of this scale for Lamu could be profound. Reduced supply of water, food, timber, fuel and raw materials combined with increased severity and frequency of drought, erosion and flooding is a realistic scenario. This would in turn put productivity, investment, livelihoods and well-being at risk, exacerbating pressure on social infrastructure and government funds from a growing population. Preliminary analysis suggests that, in a scenario of full development of the LAPSSET project, clearance of forests and mangroves (primary impacts only) would lead to a loss of ecosystem services worth at least US$ 4.4m per year (equivalent to a present value loss of US$ 74.4m when capitalised over 25 years at a discount rate of 3.5%).

However, in reality the costs would probably be far higher, because this figure does not take into account: a) all of the multiple benefits that these assets provide, b) secondary and indirect impacts on these assets, and c) other assets that would be affected (e.g. other habitats, water resources and fishing areas). On the other hand, by taking steps in the CSP to protect and restore the county's natural capital, these risks would be reduced or avoided, and key economic sectors, markets, livelihoods and communities would be more resilient. The benefits could be even higher if effort was also made in the CSP to develop new sustainable economic sectors/markets (e.g. enhancing tourism infrastructure, improved water efficiency measures, and creation of new sustainable markets/industries).

WHAT MEASURES COULD BE INCLUDED IN THE CSP TO HELP PROTECT AND RESTORE LAMU'S NATURAL ASSETS?

A top priority will be to ensure that future development (including the LAPSSET project) is planned so that it does not lead to further loss of natural capital and, ideally, leads to a net gain. To achieve this, a range of measures could be incorporated into the CSP development process, including:

- Designation the whole county according to land-use 'zones' with clearly defined acceptable and unacceptable land uses and activities for each. Planning of zones should follow the established mitigation hierarchy (i.e. avoid, mitigate, offset and/or compensate for impacts - see Figure 5), and aim to enhance the asset base overall.

- Designation of some areas for conservation (i.e. as off limits to development). This should include existing and planned protected areas, as well as other areas containing important and intact natural assets (e.g. such as forest, mangroves, coral reefs, seagrass and water resources).

- Designation of some areas for restoration, in which the primary aim is the recovery and/or rehabilitation of degraded natural assets.

- Introduction of measures to promote or enhance sustainable use of under-utilised natural assets or areas (e.g. through new or expanded sustainable natural resource-related activities, such as tourism, farming and aquaculture).

- In areas where development is allowed, ensuring that is subject to strict development control requirements (particularly where it may affect sensitive areas, habitats or features), including full assessment of the economic, social and environmental impacts, and adherence to mitigation hierarchy.

- Identification of investment requirements to maintain and/or enhance critical natural assets in the CSP's Capital Investment Framework, and securing funding from a combination of public and private sources.

- Development of procedures, guidelines, standards and permitting conditions for development control and land-use management in specific zones.

Figure 5 Overleaf - Improving spatial planning through the mitigation hierarchy

APPROACH	AIM	EXAMPLE STEPS TO BE TAKEN
AVOIDING IMPACTS	Avoid adverse impacts to critical natural assets wherever possible through careful planning and design	• Careful location and design of development zones, routes and sites across county to avoid important assets • Provide full protection (as no go area) for the Dodori and Lungi Forest Reserves • Limiting the most significant impacts of LAPSSET to within as small and as tightly controlled an area as possible • Carefully controlling further (secondary) development / land-use changes that would be encouraged by the LAPSSET project elsewhere in the county • Stringent application of development control measures to all development
MITIGATING IMPACTS	Where avoidance is not possible, minimising and/or reduce impacts a range of planning, regulatory and development control measures	• Mitigating the direct impacts of LAPSSET by reducing extent of developments, design changes, and use of different construction and operation techniques • Implement measures to mitigate the potential indirect impacts of the LAPSSET project across the county (e.g. increased pressure on water, timber, wood fuel and fish stocks) • Long-term monitoring and management of Dodori and Lungi reserves (and Kiunga Marine Reserve) to ensure they are not adversely affected
OFFSETTING AND/OR COMPENSATING FOR IMPACTS	Ensuring that any unavoidable residual impacts are adequately offset and/or compensated for (to ensure a net gain overall)	• Offsetting impacts by restoring natural assets elsewhere (to provide the same level of ecosystem service provision, taking into account interim losses) following international good practice and responsible investment standards • Funding of conservation or environmental management programmes (only as a last resort, and not as an alternative to restoration, as is difficult to establish additionality and equivalent environmental gains) • Undertaking additional restoration wherever possible (i.e. beyond what is needed to offset residual impacts) in order to achieve a net gain in natural capital

A map indicating the areas of Lamu County in which some of the most important natural assets are located is provided in Figure 6. Five types of priority area are identified taking into account their legal status, ecological characteristics, economic and social value, and the development and/or land-use activities that are (and are not) appropriate within them.

These areas should be afforded the highest levels of protection in the county-wide zoning system within the CSP.

- Protected Areas (PAs): legally protected areas (e.g. nature reserves, marine protected areas and gazetted forests). Sustainable ecotourism is potentially appropriate in these areas, along with limited facilities and infrastructure to support it. Sustainable resource use is also acceptable, if it is compatible with PA objectives and management, is strictly controlled and subject to monitoring and evaluation.

- Critical Ecologically Significant Areas One (CESA1): areas outside of PAs that contain the most ecologically important natural assets (e.g. such as mangroves, wetlands, sacred forests and conservancies) that are critical for delivering ecosystem services. These areas need to be kept in a natural or semi-natural condition, and only appropriate activities such as ecotourism and sustainable resource use (including grazing) should be allowed.

- Critical Ecologically Significant Areas Two (CESA2): other areas containing ecologically important natural assets (e.g. other forests not covered by above categories). Similar to CESA1, these areas also need to be kept in a kept in a natural or semi-natural condition, and only appropriate activities such as ecotourism and sustainable resource use (including grazing) should be allowed.

- Ecological Support Areas One (ESA1): other intact areas that are considered important for the provision of ecosystem services (e.g. fishing grounds, aquifers and buffer areas alongside rivers). These need to be kept in a functional state. Urban, industrial, mining, large-scale agriculture, large-scale infrastructure, as well as other potentially damaging activities (e.g. dredging) should be avoided in these areas.

- Ecological Support Areas Two (ESA2): other areas that are important for the provision of ecosystem services, but which have been already been significantly affected by human activities (e.g. river or wetland buffers which have been converted to agricultural fields). These areas need to be managed to maintain their remaining ecological functioning and avoid further loss. Existing land-use should be kept stable, intensification avoided and, where possible, degraded areas should be rehabilitated.

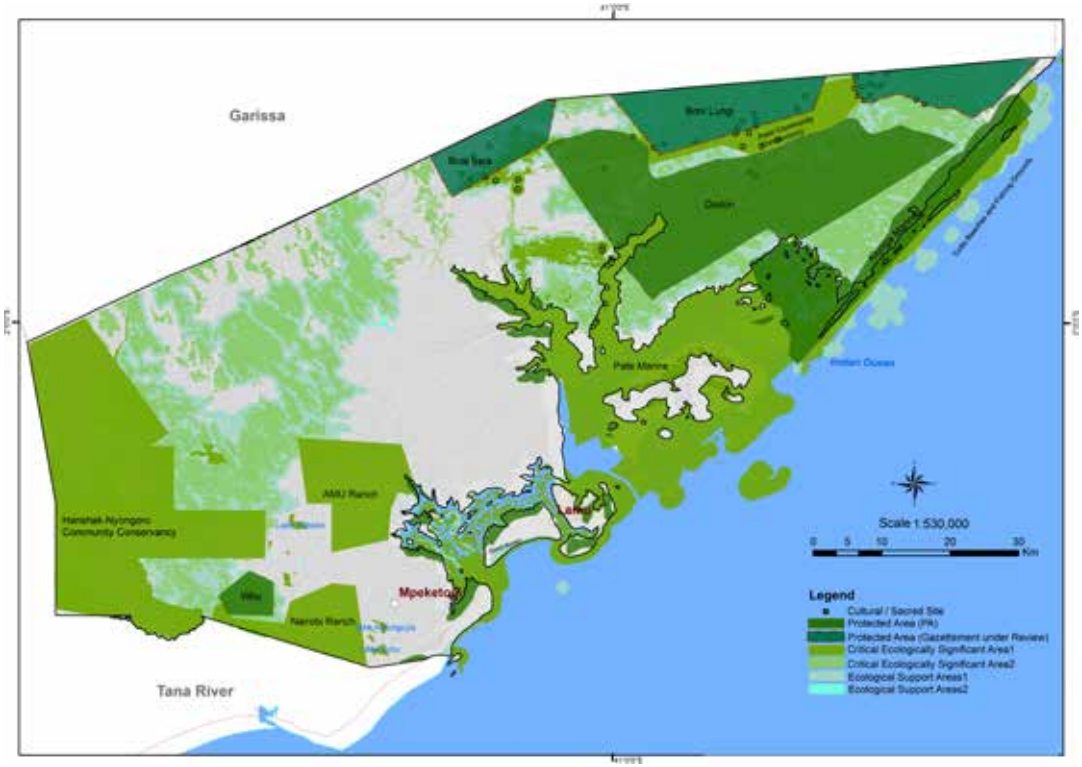


Figure 6 Map of Critical Ecologically Significant Areas and Ecological Support Areas, which should be protected within the CSP.